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THREE NEW TREE-FROGS FROM PANAMA AND BOLIVIA

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AMONG the collections from Panama and Bolivia which have accumulated at the Museum of Zoology during the past few years are three Hylas which we have been unable to identify with the known species. They are:

Hyla parkeri, sp. nov.

Diagnosis.—A small *Hyla* with long, narrow head and body, proportionately short legs and free fingers.

Type Specimen.—No. 67460, Museum of Zoology. Buenavista, Dept. Sta. Cruz, Bolivia; José Steinbach.

Description of Type.—Size small. Tongue heart-shaped and only slightly free; vomerine teeth in two closely approximated small groups on the level of the posterior border of the choanae. Head longer than broad, as wide as the narrow body. Snout elongate, projecting, longer than the diameter of the eye, which is equal to the distance between eye and nostril; canthus rostralis rounded, straight; loreal region plane; distance between nostrils equal to the interorbital

space, which is much wider than the upper eyelid; ear about half the diameter of the eye. Fingers free, disks larger than ear; palm rough with small tubercles. Outer toes two-thirds webbed, inner almost free; disks as large as ear; subarticular tubercles distinct, an oval inner metatarsal tubercle and a small, rounded, outer one; no tarsal fold. Head and postocular region with a few rounded tubercles; finely granular on throat, large granules on belly and ventral surface of thighs; a slight fold over the ear and a strong fold across the chest.

Color (in alcohol) grayish brown, with a narrow dark brown band on either side of the body, extending from the nostril, through the eye almost to the thigh; sides dark gray, sharply margined beneath on anterior part of body, fading gradually into the ventral coloration behind. A white band on edge of lip from just in front of eye, and merging into the ventral coloration behind the angle of the jaw. Limbs unicolor; immaculate yellowish white beneath.

Length of head and body 25 mm.; width of head 8 mm.; fore limb from axilla 13 mm.; hind limb from vent 35 mm. Tibio-tarsal articulation, when hind limb is extended, reaches the eye.

Remarks.—There are a hundred specimens in the Museum of Zoology collection with the same data as the type, and there are also at hand five specimens taken at Ixiamas, Bolivia. Further specimens from Buenavista are in the collection of the British Museum and Mr. H. W. Parker, for whom I take great pleasure in naming this little *Hyla,* had also recognized it as new.

All of the specimens examined are identical with the type except for certain small variations in color. Thus, there is sometimes a second dark brown band parallel with the upper one and bordering the gray band beneath; there is sometimes a slight indication of a narrow brown vertebral line and of a narrow brown band between the eyes.

Hyla parkeri resembles most closely *H. nana,* of which we have large series both from Buenavista and Ixiamas. The species are readily separable by the following characters:

nana	*parkeri*
tongue entire	tongue heart-shaped
head as long as broad	head much longer than broad
snout rounded, shorter than diameter of eye	snout elongate, longer than diameter of eye
ear one-third diameter of eye	ear one-half diameter of eye
fingers with distinct rudiment of web	fingers free
disks nearly as large as ear	disks larger than ear
back smooth	back with a few tubercles

Hyla pearsoni, sp. nov.

Diagnosis.—A *Hyla* with a superficial resemblance to *H. buckleyi,* from which species it is easily distinguished by the slight webbing of the fingers, the shorter head, the shorter leg, and the distinctive coloration.

Type Specimen.—No. 57548, Museum of Zoology. Upper Beni River, below the mouth of the Mapiri River, Bolivia; N. E. Pearson; Sept., 1921.

Description of Type.—Size medium. Tongue circular, entire, and only slightly free behind; vomerine teeth in two closely approximated groups between the choanae. Head moderate, broader than long; snout rounded, as long as the eye; loreal region concave, oblique; canthus rostralis rounded, curved. Interorbital space as broad as upper eyelid; ear distinct, two-thirds the diameter of the eye. Outer fingers only slightly webbed at the base, disks as large as ear, a slight rudiment of pollex. Toes almost entirely webbed, leaving only the last phalange of the fourth toe free; disks slightly smaller than the ear; soles tubercular, subarticular tubercles moderate, an oval projecting inner metatarsal tubercle, no tarsal fold. Back with a few rounded tubercles on the head and coccygeal region; beneath strongly granular, even on the throat; a strong fold above the ear.

Color (in alcohol) grayish brown above, with large, irregular brown spots; immediate edge of jaw white; upper lip with indistinct vertical bars (there is no trace of the light spot below the eye nor of the dark band between the eyes,

which is characteristic of our specimens of *H. buckleyi*) ; fold over ear brown; sides of thighs and ventral surface of legs marbled with brown; belly and throat strongly reticulated with brown.

Length of head and body 46 mm.; width of head 17 mm.; fore limb from axilla 21 mm.; hind limb from vent 68 mm. The tibio-tarsal articulation, when leg is extended, reaches the eye.

Remarks.—The species is named for Dr. N. E. Pearson, in recognition of the splendid collection of amphibians which he made for this museum as a member of the Mulford Expedition. There are four paratypes in the collection, three from the type locality and one from Rurrenabaque, Bolivia, which do not differ from the type in structure and only slightly in color. The males, as in *H. lepreiurii,* are much rougher dorsally than the females. A female 54 mm. in length is distended with eggs.

Since we had no material for comparison, this series had been identified tentatively as *Hyla buckleyi.* Recent collections from Bolivia have included a number of specimens of a very different *Hyla* which Mr. Parker has very kindly compared with British Museum types and has identified as *H. buckleyi.* Aside from the color differences, a comparison of the following characters will at once distinguish *pearsoni* from *buckleyi:*

buckleyi	*pearsoni*
length of snout one and one-half eye	length of snout equals eye
outer fingers one-third webbed	outer fingers webbed at base
no rudiment of pollex	a slight rudiment of pollex
extended heel reaches to or almost to end of snout	extended heel reaches eye

Hyla zeteki, sp. nov.

Diagnosis.—Vomerine teeth in two small groups just behind level of choanae; three outer fingers webbed at base; toes two-thirds webbed; ear one-third diameter of eye.

Type Specimen.—Cat. No. 63875, Museum of Zoology. Collected from a bromeliad in the Caldera Valley, above Boquete, Chiriqui Province, Panama; H. T. Gaige; Feb. 27, 1923.

Description of Type.—Size small. Tongue large, rounded, adherent. Vomerine teeth in two small, closely approximated groups between the choanae and just behind their level. Head broader than long, as broad as body. Snout rounded, as long as diameter of eye; canthus rounded, curved; loreal region concave; nostrils terminal. Eyes large, obliquely directed forward; ear distinct, one-third diameter of eye; interorbital space wider than upper eyelid. Fingers flattened, three outer slightly webbed at base, a distinct rudiment of pollex, disks larger than ear. Outer toes two-thirds webbed, inner toe almost free, disks a little smaller than those of fingers; subarticular tubercles moderate, soles granular, an oval metatarsal tubercle and a slight indication of a flattened tarsal fold. Skin smooth in the center of the back; forearms and sides of head and body with flattened granules; throat slightly, and belly and ventral surface of thighs strongly granular; vent surrounded by enlarged granules which are prolonged into two elongated glandular ridges ventrally; a fold curving over the ear and a strong fold across the chest.

Color (in life) golden tan above, becoming iridescent on sides; yellowish white beneath. Iris brownish red. A slender red vertebral stripe and a narrow spectacle-like mark around each eye, joining across the snout. In alcohol the red markings have faded and the animal has become a uniform grayish tan.

Length of head and body 27 mm.; width of head 9 mm.; fore limb from axilla 13 mm.; hind limb from vent 41 mm. Tibio-tarsal articulation, when leg is extended, reaches the front of the eye.

Remarks.—There are twelve specimens in addition to the type, ranging in size from 15 mm. to 25 mm. They were all taken in the type locality, from 3900 to 4500 ft. elevation, from bromelias. There is little structural variation in the

series, except that the webbing of the feet in the smallest specimen is much less evident than in the adults. The red marks on the head were lacking in some of them, but there was always a trace of red in the coloration.

These little Hylas were very shy and inactive. They would flatten themselves and cling so closely to the leaves that it was difficult to dislodge them without injuring the delicate little beasts. When forced out of their hiding places they would make a number of high, awkward jumps and then creep into the grass and cling there as they had in the bromelias.

The species is named for our good friend Mr. James Zetek, the veteran entomologist of Panama, whose kindly assistance and intimate knowledge of the Republic have been so willingly at the service of visiting naturalists. I have delayed naming the form because I have hoped that it might be identified with some of Schmidt's or Cope's species. It seems nearest *Hyla punctariola,* from which species it may be distinguished by the following characters:

punctariola	*zeteki*
tongue heart-shaped	tongue round
vomerine teeth widely separated	vomerine teeth closely approximated
skin smooth	sides tubercular
fingers entirely free	fingers webbed
heel to or almost to end of muzzle	heel to front of eye
disks smaller than ear	disks larger than ear

Cope's color varieties of *H. punctariola* are nearer the little Chiriquian *Hyla* in having partially webbed fingers, but they differ so widely in coloration that it seems best to recognize the species as distinct.